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ABSTRACT

The curriculum guide correlates concepts in geometry with career-oriented concepts and activities. The curriculum outline format gives the concepts to be taught, selected site related career-oriented performance objectives, concepts, and suggested instructional activities in facing page layouts. The suggested curriculum outline is compatible with all books on the approved textbook list for Louisiana. The outline is divided into the major sections of elements of geometry, introduction to proof, lines and planes, congruence, polygons and polygonal regions, circles, similarity, trigonometry, plane coordinate geometry, and solid figures. (SH)

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MATHEMATICS CURRICULUM GUIDE
CAREER ORIENTED
GEOMETRY

BULLETIN NO. 1283

Louisiana State Department of Education
Louis J. Michot, Superintendent
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RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
B. The draftsman must be familiar with geometric symbols and use them in producing drawings as prescribed by specifications.	B. Examine a house plan and from this list the geometric symbols to identify terms such as electrical outlets, door openings, windows, bathroom fixtures, etc.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
C. Geometric concepts	C. To demonstrate an understanding of basic geometric concepts, the student should be able to identify and illustrate:
1. Point	1. Point
2. Line	2. Line
3. Plane	3. Plane
4. Line segment	4. Line segment
5. Ray	5. Ray
6. Angle	6. Angle
D. Basic postulates	D. To demonstrate an understanding of postulates, the student should be able to state some basic postulates. (e.g., for any two points there is exactly one line that contains them.
E. Lines	E. To demonstrate an understanding of lines, the student should be able to define, identify, or illustrate:
1. Horizontal	1. A horizontal line
2. Vertical	2. A vertical line
3. Intersection	3. The possible intersection of two coplanar lines.
4. Parallel	4. Parallel lines.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
E. The surveyor checks the alignment of a structure by using a plumb line.	E. To construct a mathematical plumb line, tie a metal nut (or other small, heavy object) to one end of a piece of string. Attach the other end of the string to the top of a stake. To assure that the stake is driven vertically into the ground, keep the plumb line parallel to the stake while driving it.

INSTRUCTIONAL OUTLINE	PERFORMANCE OBJECTIVES
5. Skew	5. Skew lines
6. Perpendicular	6. Perpendicular lines
7. Transversal	7. A transversal
C. Angles	C. To demonstrate an understanding of angles, the student should be able to:
1. Definitions	1. Define, identify, and sketch an acute angle, a right angle, an obtuse angle, a straight angle, a reflex angle, and a dihedral angle.
2. Measurement	2. Determine the measure of an angle by using a protractor.
3. Classification	3. Classify angles from their measures (e.g., $m\angle A = 40°$, $m\angle B = 90°$, $m\angle C = 120°$, $m\angle D = 180°$, $m\angle E = 240°$)
4. Angle pairs	4. Define, identify, and sketch adjacent angles, vertical angles, complementary angles, supplementary angles, congruent angles, and a linear pair of angles.

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RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
B. A woodcraft designer uses planes in many of his designs.	B. List examples of planes in the classroom.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
IV. Congruence	IV. Congruence
A. Definition of congruence	A. To demonstrate an understanding of congruence the student should be able to define the relation "is congruent" on the set of:
1. Segments	1. All segments
2. Angles	2. All angles
3. Triangles	3. All triangles
4. Quadrilaterals	4. All quadrilaterals
B. Basic congruence postulates or theorems	B. To demonstrate further understanding of congruence the student should be able to state the basic congruence postulates (SAS Postulate, SSS Postulate, and ASA Postulate) and prove basic congruence theorems. (e.g., SAA Theorem)
C. Constructions and proofs	C. To demonstrate a further understanding of congruence, the student should be able to:
1. Congruent triangles	1. Construct a triangle congruent to a given one and prove the construction is valid.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
IV. Career Concept Some occupations require an understanding of congruence. Performance Objectives	
A. Surveyors can use congruence in determining distance.	A. Use congruence of triangles to explain how the distance across a lake can be determined.
B. A manufacturer often finds it necessary to give balance to many of his designs.	B. Design a square emblem with a triangle in one corner. Give balance to the design by constructing a congruent triangle in the opposite corner.

FUNCTIONAL CRITERIA	PERFORMANCE OBJECTIVES
2. Isosceles triangle	2. Define an isosceles triangle; define the base angles of an isosceles triangle; construct an isosceles triangle and prove the base angles are congruent.
3. Equilateral triangle	3. Define an equilateral triangle; construct an equilateral triangle and prove its angles are congruent to each other.

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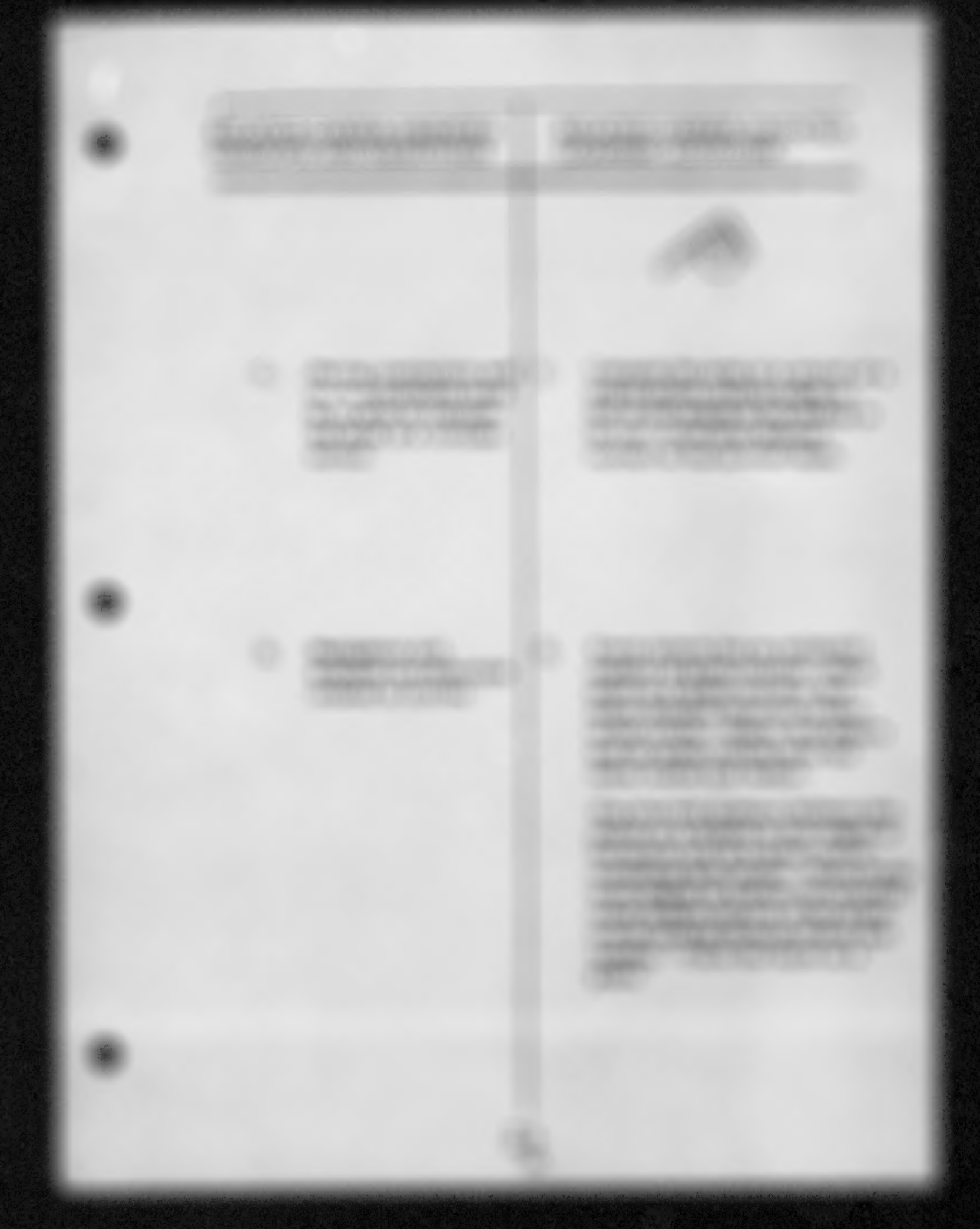

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
VII. Similarity	VII. Similarity
A. Ratio and proportion	A. To demonstrate an understanding of ratio and proportion, the student should be able to:
1. Definitions	1. Define: a. Ratio b. Proportion c. Means d. Extremes
2. Problems	2. Solve problems involving proportions.
3. Proofs	3. Prove selected theorems concerning proportion. (e.g., the means extremes theorem)
B. Similarity between two polygons	B. To demonstrate an understanding of similarity, the student should be able to:
1. Definition	1. Define the relation "is similar to" on the set of polygons.
2. Theorems	2. Illustrate and prove basic similarity theorems.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
VII. Career Concept Careers require competence in computation. Performance Objectives	
A. A professional typist uses proportion to determine the time necessary to type a manuscript.	A. Donna, a professional typist, can type 8 pages of manuscript in 12 minutes. She agreed to type an article of 20 pages. How long will it take her to type the article?
B. A surveyor is an important person in many types of construction. He measures lines and angles, and uses these measurements to determine distances which he cannot measure directly. He uses a great deal of geometry and trigonometry.	B. A and B are two points on opposite sides of a pond. Show how to find the distance between them by letting C be a point on the same side of the pond as B, and then constructing $\triangle A'B'C'$ so that it is similar to $\triangle ABC$

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
C. Similarity in triangles	C. To demonstrate an understanding of similarity, the student should be able to:
1. Altitude to the hypotenuse in a right triangle	1. Know and apply properties of the altitude drawn to the hypotenuse of a right triangle.
2. Special right triangles	2. Prove the 30-60-90 relationship and the 45-45-90 relationship, then solve problems related to these special right triangles.
3. Other triangles	3. Prove that corresponding sides of similar triangles are proportional.

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RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
C. The oil refinery plant manager must calculate volume.	C. Each cylindrical oil tank at a storage plant has a radius of 45 feet and a height of 110 feet. What is the total capacity of 35 tanks? (There are 7.5 gallons in 1 cubic foot.)